REMARKS

Request for reconsideration and allowance of all the pending claims are respectfully requested in light of the following remarks. Claims 1-34 are pending herein and stand rejected.

Claims 1 and 29 have been objected. As shown above, these claims have been amended to overcome the Examiner's objections.

FIG. 1D has been objected. In response, a replacement figure addressing the Examiner's objection enclosed herein for consideration.

Claims 1-5, 29, and 30 stand rejected under 35 U.S.C. §103(a) as allegedly being obvious over Wolf et al. (U.S. 6,496,221) hereinafter referred to as "Wolf". Claims 6-8, 31, and 32 rejected under 35 U.S.C. §103(a) as allegedly being obvious over Wolf as applied to claims 1, 2, 4, 29, and 30 above, and further in view of Corriveau et at. (4th Video Quality Experts Group Meeting, 13-17 March, 2000) hereinafter referred to as "Corriveau". Claims 9-12 stand rejected under 35 U.S.C. §103(a) as allegedly being obvious over Wolf as applied to claims 1 and 2 above, and further in view of Inazumie al. ("Quality Evaluation Method Considering Time Transition of Coded Video Quality,", IEEE 1999) hereinafter referred to as "Inazumie". Claims 13, 14, 33, and 34 stand rejected under 35 U.S.C. §103(a) as allegedly being obvious over Wolf and Corriveau as applied to claims 7 and 32 above, and further in view of Inazumie. Claims 15-23 stand rejected under 35 U.S.C. §103(a) as allegedly being obvious over Wolf and Inazumie as applied to claims 9-12 above, and further in view of Eshelman et al. (U.S. 5,390,283) hereinafter referred to "Eshelman". Claims 24-28 stand rejected under 35 U.S.C. §103(a) as allegedly being obvious over Wolf, Corriveau and Inazumi as applied to claim 13 above, an further in view of Eshelman.

Applicant respectfully traverses for the following reasons.

Instant claim 1 recites a step (b) of *providing a random set of metrics*. By contrast, Wolf teaches selection of a best subset of metrics from a set of possible metrics by using a combinatorial process for selecting a subset of the set of possible metrics, computing a composite score for the selected subset of metrics that is based on how well the selected metrics and composite score correlate with their associated subjective DMOSs, and selecting that subset out all such subsets as a best set that not only has the highest composite score but preferably satisfies other predetermined criteria, see col. 18, lines 61-67. Wolf is thus teaching a combinatorial metric subset selection process that is not recited by instant claim 1 for at least the reasons particularly discussed in the following sections.

Applicant respectfully submit that nowhere in the Wolf reference teach or suggest providing *a random set* of metrics, as recited by limitation (b) of claim 1. Wolf teaches "filter controls calculator 164 determines all sets of possible filter controls 165 such that each particular set of possible filter controls from sets of controls 165 will result in an aggregate bandwidth ...144 that will not exceed the desired ancillary bandwidth 147. ... Parameter calculators 161 calculate a particular set of possible parameters (metrics) from the sets of parameters 162 using a particular set of possible filter controls from sets of controls 165, the set of input video streams, ..." Thus, by teaching a particular set of possible parameters (metrics), Wolf is explicitly teaching-away from a random set of parameters (metrics) as recited by limitation (b) of instant claim 1.

Therefore, Applicant respectfully asserts that Wolf does not teach or suggest providing an objective metric image quality controller comprising a random set of metrics without cross correlation information, as recited by limitation (b) of instant claim 1.

Further, with regard to limitation (c) of instant claim 1, nowhere in the Wolf reference teach or suggest *applying said each one metric of said set of metrics individually to said video sequence so that* ***said each one metric*** *of said random set of metrics* ***provides an individual objective scoring value*** *of said video sequence ranging from* x_1 *to* x_n, as recited by limitation (c) of claim 1. At col. 17, lines 35-48, Wolf teaches sorting through the sets of possible parameters (metrics) 162 and producing a best set of parameters (metrics) 40 and composite score(s) 41, based on how well these parameters (metrics) 40 and score(s) 41 correlate with their associated subjective DMOSs by performing a combinatorial step that determines the best method of combining the individual parameters (metrics) to achieve a best set having the highest correlation to subjective DMOSs 160. Thus, contrary to the allegation of the Office Action, Wolf does not teach or suggest individually scoring each metric of the random set of metrics, as recited by limitation (c) of instant claim 1.

Moreover, with regard to limitations (d) and (e) of instant claim 1, nowhere in the Wolf reference teach or suggest *determining a plurality of sets of weights* (w_1 *to* w_n) *which correlate to predetermined subjective evaluations of image quality for a predetermined plurality of video sequences (n)*, as recited by limitation (d) of claim 1, or *weighting by said each one set of weights each* ***individual objective scoring*** *value* x_1 *to* x_n. At col. 17, lines 16-67, col. 18, lines 1-60, Wolf teaches selection of parameters

(metrics) that achieve the maximum correlation coefficient 171 with subjective DMOSs and computing a composite score using the equation that most closely maps parameter (metric) 40 values to subjective DMOSs 160. Further, at col. 18, lines 13-15 Wolf teaches that preferably this mapping process should utilize least squares fitting procedures that minimize the means squared error between **composite score(s) and subjective DMOSs.** By contrast, limitation (e) of instant claim 1 is weighting **individual** metric scores and not composite metric scores. Thus, contrary to the allegation of the Office Action, Wolf does not teach or suggest step (e) of instant claim 1.

Finally, with respect to steps (f)-(i) of instant claim 1, all of the locations in the Wolf reference cited by the Office Action with respect to these steps teach selecting a best subset of possible metrics by using the equation that most closely maps the metric values of a candidate subset of possible metrics to subjective DMOSs, preferably using least squares fitting procedures, see col. 18 lines 10-20, but also by using other fitting procedures including higher order polynomials and complex mathematical functions, see col. 18, lines 21-23. By contrast, claim 1 step (b) provides a random set of metrics so no metric selection process is recited by claim 1 and therefore Wolf does not teach steps (f)-(j) of instant claim 1 because these steps do not recite selecting metrics but recite ranking in step (i) correlations R that provide a correlation value for the objective evaluation F and the plurality of video sequences (n) calculated in step (g) of each of a set of evaluation functions F obtained in step (h) by repeatedly adding in step (f) the weighted individual objective scoring values of said random set of metrics for each set of weights as determined in step (d). Wolf nowhere teaches or suggests determining such a set of weights and corresponding evaluation functions F or selecting the best objective

evaluation function F as recited in steps (d) – (i) of instant claim 1, *for a random set* of metrics. Therefore, Wolf neither teaches nor suggests any of steps (f)-(i).

In view of all of the foregoing discussions, Wolf neither teaches nor suggests steps cited in instant claim 1, thus the Office Actions has failed to make out a *prima facie* case of obviousness. Accordingly, instant claim1 is allowable and the rejection of instant claim 1 should be withdrawn.

As argued above, instant claim 1 is allowable and instant claims 2-28, dependent from instant independent claim 1, are allowable for at least this reason and the rejections thereof should be withdrawn.

With regard to instant independent claim 29, the arguments analogous to those presented above for instant independent claim 1 are applicable to instant independent claim 29, in particular at least the argument with respect to weighting by said each one set of weights each individual objective scoring value provided by said each one metric.

The Office Action, therefore, has failed to make out a *prima facie* case of obviousness with respect to instant independent claim 29, claim 29 is allowable and the rejection thereof should be withdrawn.

As argued above, instant independent claim 29 is allowable and instant claims 30-34, dependent from claim 30, are allowable for at least this reason and the rejections thereof should be withdrawn.

For all the foregoing reasons, it is respectfully submitted that all the present claims are patentable in view of the cited references. A Notice of Allowance is respectfully requested.

Respectfully submitted,

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(Signature and Date)

IN THE DRAWINGS:

Please amend FIG. 1D as shown in the attached replacement sheet.

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"Replacement Sheet"

170 REPEATING STEPS (140), (150) AND (160) FOR EACH SET OF WEIGHTS PROVIDED IN STEP (130) TO DETERMINE A PLULARITY OF CORRELATION FACTORS R;

180 RANKING SAID PLURALITY OF CORRELATION FACTORS R, WHEREIN A PARTICULAR CORRELATION FACTOR OF SAID PLURALITY OF CORRELATION FACTORS HAVING A PARTICULAR CORRELATION VALUE CLOSEST TO 1 REPRESENTS A BEST RANKING OF THE RESPECTIVE COMBINED METRICS IN STEP (140) FOR EACH SET OF WEIGHTS;

190 PROVIDING IMAGE QUALITY INFORMATION TO AT LEAST ONE OF A SYSTEM OPTIMIZER AND THE VIDEO PROCESSING MODULE AS TO THE BEST RANKING OF THE RESPECTIVE COMBINED METRICS OBTAINED IN STEP (i) TO PROVIDE A BEST PERCEPTUAL IMAGE QUALITY

FIG. 1B

WHEN A PREDETERMINED NUMBER OF SETS OF METRICS = n, THE QUADRATIC MODEL TO OBTAIN THE OBJECTIVE EVALUATION F IS:

$$F = \left(\sum_{i=1}^{n} w_i x_i\right)^2$$, WHEREIN "n" IS A NON-ZERO VALUE.

FIG. 1C

WHEN A NUMBER OF THE SET OF METRICS = 4, THEN THE QUADRATIC MODEL TO OBTAIN THE OBJECTIVE EVALUATION F IS:

$$F = w^1x^{1^2} + w^2x^2 + w^3x^3 + w^4x^4 + w^5x^1x^2 + w^6x^1x^3 + w^7x^1x^4 + w^8x^2x^3 + w^9x^2x^4 + w^{10}x^3x^4$$

FIG. 1D

$$F = W1X1^2 + W2X2^2 + W3X3^2 + W4X4^2 + W5X1X2 + W6X1X3 + W7X1X4 + W8X2X3 + W9X2X4 + W10X3W4$$